puts them into a logical system more or less complete within itself, and the young student often completely misses the relation of that which occupies his mind to the universe as a whole. The author has worked out his idea in an ingenious and suggestive way.

It is impossible in a brief notice to deal adequately with the volume as a whole. In many points it shows that the writers are dealing with a condition of things that has really passed away in our country. For example, we should expect a sentence like this in an English book of a generation ago :—

" The reform we are advocating calls for nothing less than a fight *à outrance* against verbalism in every form. Such a battle could issue in nothing but good. Writers on the teaching of science have begun it already, but the old mistakes and prejudices are not easily overcome."

Whilst there is not doubt that in the material equipment of our schools on the scientific side we are a long way ahead of the Germans, it still behoves us to remember that verbalism is not impossible side by side with lecture experiments and laboratory courses. It is the " carrying idea " that gives vitality to what the boys are doing—whether it be essay-writing or using a balance. There is still a good deal of misunderstanding in regard to this matter. Sensory accessories do not constitute the difference between the real and the verbal.

J. A. Green.

COUNTY GEOGRAPHIES.

Cambridge County Geographies:—*Essex*. Pp. viii+167. *Kent*. Pp. viii+146. *Surrey*. Pp. viii+151. *Sussex*. Pp. viii+144. By G. F. Bosworth. (Cambridge : University Press, 1909.) Price 1s. 6d. each.

THE idea of this series is excellent. A series of elementary geographies, each dealing with a single county, obviously ought to exist. The present volumes are all on one model, and the model is good. First a short survey of the origin of the county under notice, and of its name, is given. Its extent, relief, river-system, geology, natural history, and climate follow. Next the population and industries are dealt with; then the history of the county, its antiquities, its communications past and present, its administrative divisions ancient and modern, and the roll of famous men born within it. Finally there is an alphabetical gazetteer of the chief towns and villages (which, it may be added with regret, is the nearest approach to an index provided in the volumes). Following the text are certain diagrams showing density and other features of population, and agricultural conditions. At the beginning of each volume is a map (by Messrs. Philip) showing the relief of the land by the flat-colour contour system, and at the end another map, the same in outline, but coloured according to geological formations.

Here, then, is an excellent skeleton, and on the whole it is well clothed. Of details of the clothing,

however, some criticism may be offered. If we rightly apprehend the purpose of the series, the treatment of the relief of the land appears to have been given less prominence than is perhaps its due, while the geology—a subject which, in its strict sense, cannot appeal to a large circle of students—is given proportionately too much. In each volume the remarks introductory to some of the subjects differ hardly at all save in wording. This may have been inevitable, though it might have been thought sufficient to infer the reader's acquaintance with the generalities of each subject. At any rate, it is a matter for congratulation that in the introductory remarks on climate common to all the volumes, the faint praise of the Meteorological Office's weather forecasts, " which are often correct," only occurs in one instance. Some of the sections deserve special commendation—the notices of the history of the counties and their architectural and other antiquities may be indicated.

The illustrations are partly from photographs and partly from line drawings. In each case the reproduction is well carried out. The architectural photographs are the best as a class. One would have welcomed a better attempt to illustrate characteristic land-forms, and in any case photography is a better medium for illustrating a work of this sort than line drawings, which in the present cases are not wholly successful. The maps are bound in on the excellent plan of attaching half of each one completely to the cover of the book—a good method of preserving them. Considered cartographically, while otherwise very fair, they have the somewhat serious fault of showing no physical features or geological formations beyond the confines of the county dealt with, so that they do not help in considering the county in relation to its surroundings, as the text very properly does.

But after these remarks it should be said that the series is well conceived, and so far well produced, and deserves success.   O. J. R. H.

SOLID AND PLANE GEOMETRY.

(1) *Practical Solid Geometry*. By the Rev. P. W. Unwin. Pp. xii+267. (London : G. Bell and Sons, 1909.) Price 4s. 6d.
(2) *Cassell's Elementary Geometry*. By W. A. Knight. Pp. vii+253. (London : Cassell and Co., Ltd., 1909.) Price 2s. 6d.

(1) THIS volume deals with the orthogonal projections of solids and of their plane sections, with explanations of figured plans and scales of slope of planes, followed by a chapter on metric or parallel pictorial projections, and one on miscellaneous problems.

It is an excellent book, well graduated, with clear though concise explanations of the numerous fully worked problems, and seems to be remarkably free from misprints for a first edition.[1] It should well fulfil the author's desire to make his readers " think in space." This volume is arranged to cover Stage 1

[1] We have found only one, viz. on p. 102, l. 4, where H.P. should be V.P

of the Board of Education Examination, and to meet the requirements of Army candidates. In the chapter on parallel projection, the theory on which it depends, viz. that it is the view, *on the YZ plane,* of the solid and the various coordinates *and* the co-ordinate axes, obtained by parallel rays inclined to that plane at some specially chosen angle, is not put quite so clearly as perhaps it might profitably have been, but the author expressly says that the theory is to be dealt with in the second volume, which is in course of preparation, and the chapter in question very clearly shows how the constructions are to be made and used for measurements. The sentence on p. 92, lines 13–16, contains an erroneous and incomplete argument, very unlike the author's usual careful accuracy. The sentence as it stands implies that vertical planes are necessarily perpendicular to horizontal lines.

There is a useful appendix on algebraic solid geometry, dealing with planes and lines, as far as the tangent plane to a sphere, and two other appendices give the requirements of the Board of Education in solid geometry and some sets of its papers.

There are a good number of examples attached to each chapter for the student to solve, and we are glad to see a good index, which greatly facilitates reference.

(2) It is difficult for the writer of a geometrical text-book for beginners to decide how much of the philosophy underlying the subject should be given. The author's treatment of the straight line and of parallel straight lines is not satisfactory. He defines a straight line as the shortest distance between two points, but makes no use of that definition in the text, and parallel straight lines are defined as straight lines drawn in the plane in the same direction. It may be contended that this is sufficient for young students, though it certainly will not satisfy all teachers. It is, however, an appeal to common notions, and, after all, a good many propositions do depend on these, however carefully the philosophical foundations may be laid. A more serious defect is where the author, after proving, by means of opposite rotations, that lines are parallel when the alternate angles are equal, promises another proof, and eventually gives one which depends on a proposition deduced from the previous one, a most flagrant case of reasoning in a circle.

The author has adopted the excellent plan of elevating a number of standard problems and theorems into the text which are usually only given as riders, and though occasionally we would have liked to see slightly different methods of construction or of proof, on the whole they are complete and clear, and the propositions are accompanied by a good number of well-chosen exercises. The range of the book is as far as the end of the sixth book of Euclid, with the omission of one or two propositions at the end. We cannot, however, find the very important proposition on which the proofs of the properties of similar triangles depend, viz. that if one transversal is divided into equal parts by a series of parallel straight lines, all transversals are also divided

by them into equal parts. The nearest approach to this is on p. 84, where a construction is given for dividing a line into equal parts, but it is merely said that " it is easy to show " the congruence of certain triangles, &c. The full proof should have been given, or, better still, the construction should have been preceded by the general theorem. Of course, the teacher can supply the omission, but it is notorious how young students usually fail to remember proofs which are not in their text-book.

OUR BOOK SHELF.

The Story of Gold. By E. S. Meade. Pp. xv+206; illustrated. (London : Appleton and Co., 1909.) Price 2s. 6d. net.

THE author of this book appears to believe that all human progress depends on a continuous rise in prices, that a rise in prices is always due to a great addition to the stock of gold in the world, and that consequently it behoves statesmen to see that gold is produced from the mines in a rapid and increasing stream. Rome decayed because the Spanish mines stopped producing. Europe weltered in misery until 1492 because the stock of precious metals continued to diminish. Thereafter all went well until about 1810. (N.B.—The price of wheat in 1809 was 157s. per quarter, with wages much lower than now.) Then the revolt of the Spanish American colonies cut off the production of the mines, and began a period of stringency which was not relieved until after 1849. From 1873 to 1896 the new gold supplies were again inadequate, prices fell, trade was bad, the human race languished. Then for a time the enormous production of gold allowed progress to be resumed. The pace, however, is rapidly becoming hotter. Although the output of gold is even more enormous now and is still increasing, the supply of other commodities has overtaken it, and unless the gold miners redouble their efforts there is little chance of a revival of prosperity.

The author is a professor of finance of the University of Pennsylvania, and consequently his discussion of geological, chemical, and engineering problems connected with gold need not be taken seriously. Nevertheless, a long succession of careless misstatements such as appear in the book becomes wearisome, and creates an atmosphere of prejudice against the author, so that his most lugubrious predictions and stirring calls to action leave the reader unconvinced and apathetic. Even when his information is correct, the author's utterances are somewhat cryptic, *e.g.* " Gold is remarkable for its freedom from corrosive solutions."

His main thesis is, of course, tinged with exaggeration. There is no doubt that rising prices benefit all those who buy to sell again, including speculators as well as merchants. How far the whole community benefits is not quite so certain. It is often contended that a flat level of prices would be best of all. Moreover, it is hardly fair for the representative of almost the only nation still addicted to frenzied finance to attribute its disasters to those laggards the gold miners.

There is no need to be pessimistic as to the adequacy of the supply of gold, but if it really became scarce, it is perfectly obvious to unprejudiced observers that gold need not be retained as the sole medium of exchange. In a sense most of its work is done already by cheques, bank notes, silver, and the like. Although in earlier times it was prized for itself alone, it is now of very little intrinsic value. It